AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Currently Amended) A Method of demodulating digital data using M'ary QAM, comprising the steps of

detecting a complex symbol vector [[D]],

establishing within which reference symbol boundaries the detected symbol vectorD falls, the given reference symbol boundaries being associated with a complex reference vector R,

establishing quadrature components ~~(E_I and E_Q)~~ of an error vector ~~(E)~~ constituting the difference between the detected vector D and the associated reference vector R, and seeking to approximate an error control signal ~~(E')~~ as feed back signal in the demodulation stage,

whereby if the detected symbol vector ~~(D)~~ falls within a first sector ~~(A)~~ in the complex plane surrounding the imaginary axis ~~(Q)~~, the first sector being delimited by at least two lines crossing origin, the first sector being symmetrical with regard to the imaginary axis, approximating the error control signal ~~(E')~~ by the imaginary quadrature component ~~(E_I)~~ of the error vector ~~(E)~~, and

whereby if the detected symbol vector ~~(D)~~ falls within a second sector ~~(B)~~ in the complex plane surrounding the real axis ~~(I)~~, the second sector being delimited by at least two lines crossing origin, the second sector being symmetrical with regard to the real axis, approximating the error control signal ~~(E')~~ by the real quadrature component ~~(E_I)~~ of the error vector ~~(E)~~.

2. (Currently Amended) The method ~~Method~~ of demodulating digital data using M'ary QAM according to claim 1,

whereby the first sector is delimited by the area $|D\ Q| \geq |D\ I|$

and the second sector is delimited by the area $|D\ Q| < |D\ I|$.

3. (Currently Amended) The method ~~Method~~ of demodulating digital data using M'ary QAM according to claim 1, whereby

the first sector is delimited by the area $|D\_Q| \geq 2 \cdot |D\_I|$,

the second sector is delimited by the area $|D\_Q| \leq ½ \cdot |D\_I|$, and

if the detected symbol vector ~~(D)~~ belongs neither to the first sector nor to the second sector, approximating the control error signal ~~(E')~~ by the mean value of the real quadrature component ~~(E_I)~~ and the imaginary quadrature component ~~(E_Q)~~.

4. (Currently Amended) The method ~~Method~~ of demodulating digital data using M'ary QAM, comprising the steps of

detecting a complex symbol vector ~~(D)~~,

establishing within which reference symbol boundaries of a given symbol boundary size ~~(T)~~ the detected symbol vector ~~(D)~~ falls, the given reference symbol boundaries being associated with a complex reference vector ~~(R)~~,

establishing quadrature components ~~(E_I and E_Q)~~ of an error vector ~~(E)~~ constituting the difference between the detected vector ~~(D)~~ and the associated reference vector ~~(R)~~,

deriving a control error signal ~~(E')~~ from the error vector ~~(E)~~, the control error signal

using a weighted error signal ~~(WE)~~ being a function of the derived error signal ~~(E')~~ as a feed-back signal in the demodulation stage, whereby

the weighted error signal ~~(WE)~~

- approaches zero for error signals ~~(E)~~ approaching zero,

- attains a positive value for positive values close to zero and attains a negative value for negative values close to zero,

- approaches zero when the error signal vector approaches the symbol boundaries of the detected symbol.

5. (Currently Amended) The method ~~Method~~ according to claim 4, wherein if the error signal vector ~~(E)~~ exceeds the symbol boundaries, the weighted error signal ~~(WE)~~ attains a reduced value or a zero value.

6. (Currently Amended) The method ~~Method~~ according to claim 5, wherein the error signal is reduced according to

$$WE = E'(1 - \frac{2W}{T})$$

where E' corresponds to the deviated control error ~~(E')~~ and T corresponds to the symbol boundary size and where W = Max {abs(E_I) ; abs(E_Q)}.

7. (Currently Amended) The method ~~Method~~ according to claim 4 ~~any of claims 4-6~~, wherein no weighting is performed for outer corner portions ~~(34)~~ of the M'ary QAM constellation.

8. (Currently Amended) The method ~~Method~~ according to claim 7, wherein if the detected signal ~~(D)~~ falls outside the symbol boundaries along the Q and I axes ~~(36)~~, the weighting function WE=0 is applied.